

1 We claim:

1 1. A method to provide information to multiple data storage devices, comprising the  
2 steps of:  
3 providing a first data storage device and a second data storage device, wherein said first  
4 data storage device is capable of communicating with said second data storage device;  
5 providing first information to said first data storage device at a first time;  
6 providing second information to said first data storage device;  
7 determining if said second information comprises a synchronous copy attribute;  
8 operative if said second information comprises a synchronous copy attribute,  
9 synchronously providing said first information to said second data storage device;  
10 operative if said second information does not comprise a synchronous copy attribute,  
11 providing said first information to said second data storage device at a second time, wherein said  
12 second time is later than said first time.

1 2. The method of claim 1, wherein said second information comprises a synchronous  
2 copy attribute, and wherein said first data storage device comprises a first information storage  
3 medium, and wherein said second data storage device comprises a second information storage  
4 medium, further comprising the following steps:  
5 writing said first information to said first information storage medium;  
6 writing said first information to said second information storage medium;  
7 determining if said first information has been written to both said first information  
8 storage medium and to said second information storage medium;

9           operative if said first information has been written to both said first information storage  
10 medium and to said second information storage medium, generating third information.

1           3.       The method of claim 2, wherein said first information is provided to said first data  
2 storage device by a host computer, and wherein said third information comprises a write  
3 complete signal, further comprising the step of providing said write complete signal to said host  
4 computer.

1           4.       The method of claim 1, wherein said second information does not comprise a  
2 synchronous copy attribute, and wherein said first data storage device comprises a first  
3 information storage medium, further comprising the following steps:

4           writing said first information to said first information storage medium;  
5           determining if said first information has been written to said first information storage  
6 medium;

7           operative if said first information has been written to said first information storage  
8 medium, generating third information.

1           5.       The method of claim 4, wherein said first information is provided by a host  
2 computer capable of communicating with said first data storage device, and wherein said third  
3 information comprises a write complete signal, further comprising the step of providing said  
4 write complete signal to said host computer.

1           6.       The method of claim 5, wherein said second data storage device comprises a  
2 second information storage medium, further comprising the steps of:  
3           scheduling the transmission of said first information to said second data storage device;  
4           providing said first information to said second data storage device;

5 writing said first information to said second information storage medium.

1 7. The method of claim 1, further comprising the steps of:

2 determining if said first information must be synchronously provided to said second data  
3 storage device;

4 operative if said first information must be synchronously provided to said second data  
5 storage device, generating a write command comprising said synchronous copy attribute,  
6 wherein said write command comprises said second information.

1 8. The method of claim 7, wherein said second information need not be

2 synchronously copied to said second data storage device, comprising the step of generating a  
3 write command comprising an asynchronous copy attribute.

1 9. The method of claim 1, further comprising the steps of:

2 providing a computer;

3 generating said first information by said computer.

1 10. The method of claim 9, wherein said computer comprises a memory, further  
2 comprising the steps of:

3 saving said first information in said memory;

4 determining if said first information should be provided to said first data storage device;

5 operative if said first information should be provided to said first data storage device,

6 providing said first information from said memory to said first data storage device.

1 11. An article of manufacture comprising a computer useable medium having

2 computer readable program code disposed therein to provide information from a first data

storage device to a second data storage device, the computer readable program code comprising a series of computer readable program steps to effect:

receiving at a first time first information provided to said first data storage device;

receiving second information;

determining if said second information comprises a synchronous copy attribute;

operative if said second information comprises a synchronous copy attribute,

synchronously providing said first information to a second data storage device;

operative if said second information does not comprise a synchronous copy attribute,

providing said first information to a second data storage device at a second time, wherein said

second time is later than said first time.

12. The article of manufacture of claim 11, wherein said second information comprises a synchronous copy attribute, and wherein said first data storage device comprises a first information storage medium, and wherein said second data storage device comprises a second information storage medium, said computer readable program code further comprising a series of computer readable program steps to effect:

writing said first information to said first information storage medium;

writing said first information to said second information storage medium;

determining if said first information has been written to both said first information storage medium and to said second information storage medium;

operative if said first information has been written to both said first information storage medium and to said second information storage medium, generating third information.

1           13.     The article of manufacture of claim 12, wherein said first information is provided  
2 by a host computer, and wherein said third information comprises a write complete signal, said  
3 computer readable program code further comprising a series of computer readable program steps  
4 to effect providing said write complete signal to said host computer.

1           14.     The article of manufacture of claim 11, wherein said second information does not  
2 comprise a synchronous copy attribute, and wherein said first data storage device comprises a  
3 first information storage medium, said computer readable program code further comprising a  
4 series of computer readable program steps to effect:

5                 writing said first information to said first information storage medium;

6                 determining if said first information has been written to said first information storage  
7 medium;

8                 operative if said first information has been written to said first information storage  
9 medium, generating third information.

1           15.     The article of manufacture of claim 14, wherein said first information is provided  
2 by a host computer, and wherein said third information comprises a write complete signal, said  
3 computer readable program code further comprising a series of computer readable program steps  
4 to effect providing said write complete signal to said host computer.

1           16.     The article of manufacture of claim 15, wherein said second data storage device  
2 comprises a second information storage medium, said computer readable program code further  
3 comprising a series of computer readable program steps to effect:

4                 scheduling the transmission of said first information to said second data storage device;

5                 providing said first information to said second data storage device;

6 writing said first information to said second information storage medium.

1 17. The article of manufacture of claim 11, said computer readable program code

2 further comprising a series of computer readable program steps to effect:

3 determining if said first information must be synchronously provided to said second data  
4 storage device;

5 operative if said first information must be synchronously provided to said second data  
6 storage device, generating a write command comprising said synchronous copy attribute,  
7 wherein said write command comprises said second information.

1 18. The article of manufacture of claim 17, wherein said second information need not  
2 be synchronously copied to said second data storage device, said computer readable program  
3 code further comprising a series of computer readable program steps to effect generating a write  
4 command comprising an asynchronous copy attribute.

1 19. The article of manufacture of claim 11, said computer readable program code  
2 further comprising a series of computer readable program steps to effect:  
3 determining if said first information should be provided to said first data storage device;  
4 operative if said first information should be provided to said first data storage device,  
5 providing said first information from said memory to said first data storage device.

1 20. A computer program product usable with a provide information from a first data  
2 storage device to a second data storage device, comprising:

3 computer readable program code which causes said programmable computer processor to  
4 receive first information at a first time;

5 computer readable program code which causes said programmable computer processor to  
6 receive second information at said first time;

7 computer readable program code which causes said programmable computer processor to  
8 determine if said second information comprises a synchronous copy attribute;

9 computer readable program code which, if said second information comprises a  
10 synchronous copy attribute, causes said programmable computer processor to synchronously  
11 provide said first information to a second data storage device;

12 computer readable program code which, if said second information does not comprise a  
13 synchronous copy attribute, causes said programmable computer processor to provide said first  
14 information to a second data storage device at a second time, wherein said second time is later  
15 than said first time.

1 21. The computer program product of claim 20, wherein said second information  
2 comprises a synchronous copy attribute, and wherein said first data storage device comprises a  
3 first information storage medium, and wherein said second data storage device comprises a  
4 second information storage medium, further comprising:

5 computer readable program code which causes said programmable computer processor to  
6 write said first information to said first information storage medium;

7 computer readable program code which causes said programmable computer processor to  
8 write said first information to said second information storage medium;

9 computer readable program code which causes said programmable computer processor to  
10 determine if said first information has been written to both said first information storage medium  
11 and to said second information storage medium;

12 computer readable program code which, if said first information has been written to both  
13 said first information storage medium and to said second information storage medium, causes  
14 said programmable computer processor to generate third information.

1 22. The computer program product of claim 21, wherein said first information is  
2 provided by a host computer, and wherein said third information comprises a write complete  
3 signal, further comprising computer readable program code which causes said programmable  
4 computer processor to provide said write complete signal to said host computer.

1 23. The computer program product of claim 20, wherein said second information does  
2 not comprise a synchronous copy attribute, and wherein said first data storage device comprises  
3 a first information storage medium, further comprising:

4 computer readable program code which causes said programmable computer processor to  
5 write said first information to said first information storage medium;

6 computer readable program code which causes said programmable computer processor to  
7 determine if said first information has been written to said first information storage medium;

8 computer readable program code which, if said first information has been written to said  
9 first information storage medium, causes said programmable computer processor to generate  
10 third information.

1 24. The computer program product of claim 23, wherein said first information is  
2 provided by a host computer, and wherein said third information comprises a write complete  
3 signal, further comprising computer readable program code which causes said programmable  
4 computer processor to provide said write complete signal to said host computer.



1           25.    The computer program product of claim 24, wherein said second data storage  
2 device comprises a second information storage medium, further comprising:  
3           computer readable program code which causes said programmable computer processor to  
4 schedule the transmission of said first information to said second data storage device;  
5           computer readable program code which causes said programmable computer processor to  
6 provide said first information to said second data storage device;  
7           computer readable program code which causes said programmable computer processor to  
8 write said first information to said second information storage medium.

1           26.    The computer program product of claim 20, further comprising:  
2           computer readable program code which causes said programmable computer processor to  
3 determine if said first information must be synchronously provided to said second data storage  
4 device;  
5           computer readable program code which, if said first information must be synchronously  
6 provided to said second data storage device, causes said programmable computer processor to  
7 generate a write command comprising a synchronous copy attribute.

1           27.    The computer program product of claim 26, wherein said second information  
2 need not be synchronously copied to said second data storage device, further comprising  
3 computer readable program code which causes said programmable computer processor to  
4 generate a write command comprising an asynchronous copy attribute.

1           28.    The computer program product of claim 20, further comprising:  
2           computer readable program code which causes said programmable computer processor to  
3 determine if said first information should be provided to said first data storage device;

- 4 computer readable program code which, if said first information should be provided to
- 5 said first data storage device, causes said programmable computer processor to provide said first
- 6 information to said first data storage device.